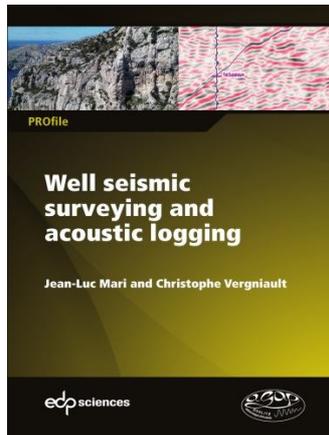


Les Cahiers de l'AGAP N°4-English version

Well seismic surveying and acoustic logging

An overview of the current state of knowledge in the geotechnical field and possible methodology transfers from the oil industry to near surface studies

Jean-Luc Mari, Christophe Vergniault



This fourth book was written at the initiative of AGAP-Qualité (Association for Quality in Applied Geophysics). It is intended for contractors or owners who would like to know more about a method they recommend and service providers to help them in the organization, implementation and interpretation of seismic and acoustic logging.

It is not an academic work ; but a collection of examples to know how to implement and interpret geophysical measurements by identifying the limits and applications of different methods.

The editors of this book are practitioners with extensive practical experience in a wide variety of fields of application.

Approaches that are typically applied in deep exploration geophysics, combining different seismic and logging methods, can be technically adapted for certain geotechnical or hydrogeological surveys or some site characterizations in the framework of seismic hazard studies. Currently it is entirely feasible to implement this type of geophysical surveying if the situation requires.

After reviewing the current state of knowledge regarding borehole measurements of subsurface shear velocities applied to the geotechnical field, this book illustrates the feasibility of carrying out vertical seismic profiles (VSPs) and logs in this field.

This approach also illustrates the value of combining velocity measurements of formations provided by borehole seismic tools (VSP) and acoustic (sonic) tools.

An innovative example of the application of borehole seismic and logging methods is then presented in the case study of a relatively near-surface (from 20 to 130 m) karst carbonate aquifer. It shows how a multi-scale description of the reservoir can be carried out by integrating the information provided by different 3D-THR surface seismic methods, full waveform acoustic logging, VSP with hydrophones, borehole optical televiewer and flow measurements.

In this book the authors provide readers with guidelines to carry out these operations, in terms of acquisitions as well as processing and interpretation. Thus, users will be able to draw inspiration to continue transferring petroleum techniques and other innovative methods for use in near-surface studies.

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